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| 10/684,030 | 10/09/2003 | Michael E. Goss | 200315391-1 | 3183 |

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
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| EXAMINER |
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PAPPAS, PETER

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| ART UNIT | PAPER NUMBER |
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2628

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/684,030

Applicant(s)

GOSS ET AL.

Examiner

Peter-Anthony Pappas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s).

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3, 6, 14, 22, 23 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 2 recites the limitation "...wherein said providing access to a source of said visual data..." (lines 1-2). There is insufficient antecedent basis for this limitation in the claim.
4. Claim 3 recites the limitation "...wherein said generating visual data streams..." (line 1). There is insufficient antecedent basis for this limitation in the claim.
5. Claim 6 recites the limitation "...wherein said geometric object..." (line 1). There is insufficient antecedent basis for this limitation in the claim.
6. Claim 14 recites the limitation "...wherein said source..." (line 1). There is insufficient antecedent basis for this limitation in the claim.
7. Claim 22 recites the limitation "...wherein said providing access to a source of said visual data..." (lines 1-2). There is insufficient antecedent basis for this limitation in the claim.
8. Claim 23 recites the limitation "...wherein said generating visual data streams..." (line 1). There is insufficient antecedent basis for this limitation in the claim.

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9. Claim 26 recites the limitation "...wherein said geometric object..." (line 1).

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-4, 7-15, 17-24 and 27-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Jain et al. (U.S. Patent No. 5, 745, 126).

12. In regard to claim 1 Jain et al. teaches a method and system in which a viewer can command the selection of real, or even the synthesis of virtual, video images of the scene in response to any of his or her desired and selected (i) spatial perspective on the scene, (ii) static or dynamically moving object appearing in the scene, or (iii) event depicted in the scene. (col. 7, lines 37-42; col. 8, lines 41-51). Jain et al. teaches synthesizing a virtual video camera, and a virtual video image, from multiple real video images obtained by multiple real video cameras (col. 1, lines 24-27).

Jain et al. teaches that a computer receives from a prospective user/viewer of the scene a user/viewer-specified criterion relative to which criterion the user/viewer wishes to view the scene. From a (i) 3D model and (ii) the criterion, the computer produces a particular 2D image of the scene that is in accordance with the user/viewer-specified criterion. This particular 2D image of the real-world scene is then displayed on a video display to the user/viewer (col. 9, lines 8-16). However, the computer is not limited to

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selecting from the 3D model a 2D image that is, or that corresponds to, any of the images of the real-world scene as was imaged by any of the multiple video cameras. Instead, the computer may synthesize from the 3D a completely new 2D image that is without exact equivalence to any of the images of the real-world scene as have been imaged by any of the multiple video cameras (col. 9, lines 57-61). It is noted said 2D images is considered to comprise a view volume with a defined field of view.

Jain et al. illustrates in Fig. 13 a graphical illustration showing the intersection formed by the rectangular viewing frustum of each camera scene onto the environment volume. The filled frustum representing possible areas where the object can be located in the 3D model while, by use of multiple views, the intersection of the frustum from each camera will closely approximate the 3D location and form of the object in the environment model (col. 11, lines 66-67; col. 12, lines 1-7).

Jain et al. teaches that a viewer interface permits said viewer to select the perspective that he or she wants (col. 18, lines 7-8), wherein said interface includes a 3D cursor that moves in 3D space (col. 22, lines 31-35). It is noted that said cursor is considered to represent a participant (e.g. user/viewer) within said virtual environment.

Jain et al. teaches that the footprint of a bounding box is projected to the primary surface of motion by intersecting a ray drawn from the optic center of that particular camera through the foot of the bounding box with the ground surface. All supporting observations are used (with appropriate weighting based on distance from the camera, direction of motion, etc.) to update the position of each object (col. 33, lines 53-65). Jain et al. implicitly teaches determining a proximity of a representation of an observed

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object in said virtual environment to said view volume. For example, as disclosed above Jain et al. teaches a plurality of viewing frustums specific to respective cameras from which said viewing volume is generated. Whether or not said viewing volume is a view volume derived from one of said cameras or generated synthetically from a plurality of said cameras said volume has a bounds and the objects contained within said bounds must be determined to be rendered. It is noted that the respective claim language is silent as to the value or range of values that define said proximity.

Jain et al. implicitly teaches processing a view dependent visual data stream of said observed object only when said representation is within a specified proximity to said view volume. For example, an observed object (e.g. a tracked football player – col. 7, lines 51-64) located within a given displayed view volume (e.g. view volume of a camera – col. 7, lines 65-67; col. 8, lines 1-9) would only be displayed while said object is contained in said view volume.

13. In regard to claim 2 Jain et al. teaches synthesizing a virtual video camera, and a virtual video image, from multiple real video images obtained by multiple (viewpoints) real video cameras (col. 1, lines 24-27). Objects of interest in the scene are identified and classified in these 2D images. These multiple 2D images of the scene, and their accompanying object information, are then combined in a computer into a 3D video database, or model, of the scene (col. 8, lines 55-60). The ultimate response of the MPI video system is to synthesize the exact synthetic image, and image sequence, the viewer desires and demands. Even here, no image can be formed where no source image data exists (col. 19, lines 12-16).

14. In regard to claim 3 the rationale disclosed in the rejection of claims 1 and 2 is incorporated herein. It is noted that a new view synthesis technique is considered to read on a new viewpoint (e.g. the selection of a new viewpoint by said user).

15. In regard to claim 4 it is noted said display information is sent to said user for display (Fig. 1, element 18).

16. In regard to claim 7 Jain et al. teaches that an object that is out of view, too small, and/or occluded from view in one camera is in view, large and/or un-occluded to the view of another camera (col. 34, lines 43-45). Jain et al. further teaches that camera handoff should be understood to be the event in which a dynamic object passes from one camera coverage zone to another. The multi-perspective perception system must maintain a consistent representation of an object's identity and behavior during camera handoff (col. 29, lines 59-63). It is noted that when said camera handoff occurs that the display from the camera from which focus has been passed is ceased to be displayed.

17. In regard to claim 8 Jain et al. teaches maintaining video information even though it is no longer associated with a given displayed object – e.g. hysteresis (col. 8, lines 55-60; col. 14, lines 60-64; col. 18, lines 27-30). It is implicitly taught that Jain et al. is able to determine in advance if video information is to be needed – e.g. anticipation (col. 25, lines 5-11). It is noted that the area surrounding, but not necessarily displayed (e.g. the entire football field), for said object (e.g. a tracked football player) is considered to read on an extended boundary.

18. In regard to claim 9 the rationale disclosed in the rejection of claim 3 is incorporated herein. It is noted that when a perspective is selected by a user, be said

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selected perspective the first perspective chosen or a different perspective then the current one, that a view volume is generated for said respective perspective.

19. In regard to claim 10 the rationale disclosed in the rejection of claim 7 is incorporated herein.

20. In regard to claim 11 it is noted a tracked football player is considered a local participant (e.g. said football player is localized to the respective football game said player is participating in).

21. In regard to claim 12 Jain et al. teaches a virtual collaborative environment that be utilized by a plurality (N-way) of users (col. 14, lines 43-59).

22. In regard to claim 13 the rationale disclosed in the rejection of claim 1 is incorporated herein.

23. In regard to claim 14 the rationale disclosed in the rejection of claim 3 is incorporated herein.

24. In regard to claim 15 the rationale disclosed in the rejection of claim 4 is incorporated herein.

25. In regard to claim 17 the rationale disclosed in the rejection of claim 7 is incorporated herein.

26. In regard to claim 18 the rationale disclosed in the rejection of claim 8 is incorporated herein.

27. In regard to claim 19 the rationale disclosed in the rejection of claim 10 is incorporated herein. It is noted the resulting display from said change of camera

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(change of location of said user/viewer) is considered to read on a change of view volume.

28. In regard to claim 20 the rationale disclosed in the rejection of claim 10 is incorporated herein (e.g. said tracked football player).

29. In regard to claim 21 Jain et al. teaches that a configuration of the MPI football video/television system is shown in Fig. 3. The current system consists of a UNIX workstation, a laser disc player, a video capture board, and a TV monitor and graphical display (col. 21, lines 37-42). Jain et al. teaches that said system utilizes microprocessors (col. 18, lines 52-56) and that said method is implemented by a programmed computer processes (col. 17, lines 51-67; col. 18, lines 1-44). It is implicitly taught that said processes, to be executed by a processor(s), are stored on computer readable medium (e.g. memory) connected to said processors as said processes must be stored in some form computer readable medium as well as able to be delivered to said processors to be processed.

30. In regard to claim 22 the rationale disclosed in the rejection of claim 2 is incorporated herein.

31. In regard to claim 23 the rationale disclosed in the rejection of claim 3 is incorporated herein.

32. In regard to claim 24 the rationale disclosed in the rejection of claim 4 is incorporated herein.

33. In regard to claim 27 the rationale disclosed in the rejection of claim 7 is incorporated herein.

34. In regard to claim 28 the rationale disclosed in the rejection of claim 8 is incorporated herein.

35. In regard to claim 29 the rationale disclosed in the rejection of claim 9 is incorporated herein.

36. In regard to claim 30 the rationale disclosed in the rejection of claim 10 is incorporated herein.

37. In regard to claim 31 the rationale disclosed in the rejection of claim 11 is incorporated herein.

38. In regard to claim 32 the rationale disclosed in the rejection of claim 12 is incorporated herein.

39. In regard to claim 33 the rationale disclosed in the rejection of claim 1 is incorporated herein. Jain et al. teaches that said method is implemented by a programmed computer processes (col. 17, lines 51-67; col. 18, lines 1-44). It is noted said processes are considered to read on instructions. It is implicitly taught that said processes, to be executed by a processor(s), are stored on computer readable medium (e.g. memory) as said processes must be stored in some form computer readable medium to be processed.

Claim Rejections - 35 USC § 103

40. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

41. Claims 5, 6, 16, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. (U.S. Patent No. 5, 745, 126), as applied to claims 1-4, 7-15, 17-24 and 27-33, in view of Sullivan (U.S. Patent No. 6, 100, 862).

42. In regard to claim 5 Jain et al. fails to explicitly teach wherein said view volume comprises a series of expanding cross-sections of a geometric object. Sullivan teaches a multi-planar volumetric display (MVD) system and method of operation are disclosed which generate volumetric 3D images (col. 2, lines 56-58). Sullivan teaches wherein a view volume comprises a series of expanding cross-sections of a geometric object (col. 6, lines 22-33; Fig. 1). It is noted that, at least in part, said user-selected perspective is considered to determined a view direction.

It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Sullivan into the system taught by Jain et al., because through such incorporation it would provide an improved means of presenting the display information generated by Jain et al. as said information would be presented in a more realistic, e.g. 3D, manner.

43. In regard to claim 6 Jain et al. teaches that the system receives and processes multiple video views (images) generally of the football field (col. 7, lines 55-57). It is noted a football field is considered a four-sided rectangular plane.

44. In regard to claim 16 the rationale disclosed in the rejection of claim 5 is incorporated herein.

45. In regard to claim 25 the rationale disclosed in the rejection of claim 5 is incorporated herein.

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46. In regard to claim 26 the rationale disclosed in the rejection of claim 6 is incorporated herein.

Conclusion

47. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure: Foley et al. (specifically – p. 237-242; Fig. 6.46).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 571-272-7646. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Peter-Anthony Pappas
Examiner
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PP

A handwritten signature in black ink, appearing to read "Ulka J. Chauhan". The signature is fluid and cursive, with the first name "Ulka" and last name "Chauhan" clearly distinguishable.

Ulka J. Chauhan

Supervisory Patent Examiner